King County
Department of
Natural Resources and Parks
Wastewater Treatment Division

Frequently Asked Questions – West Point Treatment Plant Restoration

What caused the flooding in the plant?
Engineering firm CH2M conducted an independent root cause analysis to piece together the sequence of events that occurred at the West Point Treatment Plant when equipment failure and high flows contributed to serious flooding early on Feb. 9, 2017.

An intense storm with heavy rain was sending maximum flows of 440 million gallons per day into the plant.

The problem began with an instantaneous fault in the electrical systems in the effluent pumping station. This caused one of the power feeds to shut down, which led to all the pumps shutting down. These pumps help move treated wastewater -- or effluent-- out of the treatment plant and out into Puget Sound.

During this time, the plant operators were trying to hold flows inside the plant to allow the electricians to restart the pump station and avoid a raw sewage bypass. Operators were relying on an automated system that was measuring the level of the water in the primary treatment tanks. When this automated system senses levels are within one foot of the top of the tanks, the raw sewage pumps automatically shut down and the emergency bypass gates automatically open. However, these level sensors, also called float switches, did not work. If they had worked properly, the flooding would not have happened.

The time between when an electrical failure occurred in the effluent pumping station and when the primary tanks first started to overflow was only 12 minutes. The weather did not cause the bypass and flooding, but it contributed significantly largely because at this rate of flow we have so little time to respond to any problem.

We have a theory about why the float switches did not work. They are routinely inspected and cleaned and go through a testing procedure, but we think they may have become bent during maintenance, causing too much friction in the device that prevents them from floating.

We have examined numerous components in the electrical system and have yet to pinpoint the exact piece of equipment that could have caused the power to go out at the effluent pumping station. Although we continue to investigate the source of the problem we have decided to proceed with replacing several pieces of electrical equipment in the pumping station.

We are also cooperating with the King County Council as they conduct an independent review. The findings of the review are expected to be released in July 2017.

How much wastewater overflowed during the bypasses?
An estimated 180 million gallons of stormwater and wastewater overflowed during the 19 hours that the plant was offline on Feb. 9. In the days after partial wastewater treatment resumed, heavy rains prompted two additional emergency bypasses on Feb. 15-16 that discharged about 55 million gallons of stormwater and wastewater over 20 hours. No additional bypasses have occurred since Feb. 16.

What was the role of the operations crew in the overflow?
An independent root-cause analysis clearly points to a combination of electrical system and equipment failure. The crew of nine employees on duty that night were licensed, trained professionals who followed established protocols for managing plant operations during high flows and emergencies.

How bad was the damage?
The unprecedented flooding caused serious damage. But unlike wastewater treatment plants damaged in storms or natural disasters, the infrastructure for secondary treatment remained intact, as did all the lift stations. Some equipment such as motors and pumps were quickly repaired and returned to service. Temporary equipment has been installed in areas where repairs will require more time.

What is the time estimate for full restoration of the treatment plant?
We set April 30 as the date to begin resuming full secondary treatment, which relies on beneficial microorganisms that decompose soluble organic matter in wastewater and solids. Like other living creatures, microorganisms that treat wastewater need the right combination of food, heat, light, and air to thrive.

Cultivating the microorganisms will be a delicate balance of time, testing and biological expertise. If it is not done completed properly, we risk seriously damaging our secondary system and delaying its recovery for several months instead of weeks.

Will there be any increase in truck traffic through Discovery Park and Magnolia during the restoration?
During West Point's restoration, the plant will produce more solids than the digesters can safely process, so we'll need to temporarily haul the surplus solids to South Plant in Renton. This will cause small but necessary increase in truck traffic from the plant, and include a brief period where trucks will operate outside the established hauling hours of 8:30 a.m. to 4:30 p.m. Up to 13 solids trucks spread out over a 24-hour period could be expected during the next 7-10 days, and this includes the Loop biosolids trucks. As the plant's ability to process more solids increases, the truck traffic will decrease and trucking will again be confined to permitted hauling hours.

How much will the repairs cost? Who will pay for it?
A cost estimate for the complete restoration is being prepared and will be available the end of April. King County carries insurance policies for $250 million. The deductible is $250,000.

Has this ever happened before? How often does the plant treat such high flows?
West Point is designed to handle peak flows of 440 million gallons of stormwater and wastewater during the wet winter months. It is normal for the plant to reach this capacity during very heavy rains, which occur several times a year. During severe storms or emergencies, redundancies in our system enable us to send flows to other plants to protect workers and equipment.

What is the likelihood of another bypass at this point?
With drier spring weather coinciding with the restoration of treatment plant capacity, the probability of a storm-related bypass is declining. However, the plant was engineered with a bypass outfall to protect workers and equipment in the event of an emergency, so there may be future situations, even after the plant is fully restored, where a stormwater-sewage bypass is necessary for safety.

If an emergency bypass occurs, we will notify the media and the public as quickly as possible, post affected beaches as closed, and inform health and regulatory agencies.

How will you make sure this does not happen again?
The completed root-cause analysis has already prompted internal review of our operation and maintenance procedures. Going beyond this, we are cooperating with the King County Council on an independent third-party review, which is expected to report out its findings in July.

What level of wastewater treatment is occurring at West Point?
Incoming wastewater is screened of trash and debris, organic solids are being settled out and processed, and the remaining water is disinfected, dechlorinated and returned to Puget Sound through a deep-water outfall that is about three-quarters of a mile offshore.

We are carefully restoring the biology that makes secondary treatment possible, and expect to resume the secondary process by April 30. It's important to point out that this process takes time and care to do correctly, and that it will take time before we are able to treat wastewater to the level required under our permit.

Will King County get fined?
We reported the incident to the state Department of Ecology immediately and continue to update the agency about operational conditions and permit compliance. DOE is a regulatory agency responsible for enforcing the permit conditions under which we operate. We expect DOE will pursue enforcement action, which could include penalties such as fines.

Where does money go when King County pays fines?
Fines and penalties typically go into water quality enforcement programs, but the Department of Ecology can answer that question.

What were the public health and water quality impacts of the bypasses?
While bypass flows were highly diluted, with as much as 90 percent being stormwater, the bacteria and pathogens in raw sewage can make people sick. As a precaution, we posted nearby Puget Sound beaches as closed to protect human health. Beaches were reopened on

Feb. 21 when daily water-quality testing indicated there was no longer any risk to human health.

Though we don't expect long-term impacts from the temporary bypasses on Feb. 9, 15-16, or the limited treatment in the weeks following the incident, we have committed to additional water quality monitoring at various locations in Puget Sound, including beaches. This data will be updated and posted online regularly. To date, the monitoring data indicate normal levels of bacteria, trace metals, and nutrients.

How did the bypasses impact fish and wildlife?
In general, the temporary discharge of undisinfected wastewater from the emergency bypass outfall is not expected to result in significant adverse effects to fish, other aquatic organisms, or wildlife in Puget Sound. The large volume of water and significant tidal exchange and current in the vicinity of the West Point outfall result in rapid dispersion of the wastewater.

King County has conducted routine water quality monitoring in Puget Sound for about five decades. We will be doing even more water quality monitoring to better understand whether there is any noticeable change from the baseline data as the plant resumes normal operation.

Why are bypassed flows 85-90 percent stormwater and 10-15 percent sewage?
In Seattle, like many older cities, sewer pipes carry both wastewater (used water and sewage that goes down the drain in homes and businesses) and stormwater (rain or snow that washes off streets and parking lots) to a sewage treatment plant. In many parts of Seattle, the mixed wastewater and stormwater flow together in a single pipe, which is called a combined sewer system. West Point treats flows from this combined sewer system.

What triggers a beach closure?
In the event of a sewage overflow or emergency bypass, King County notifies health and regulatory agencies and posts warnings to avoid contact with the water at public beaches and access points when an overflow event occurs.

King County's Environmental Lab samples affected waters and tests for bacterial contamination. The bacteria and other pathogens that go into marine waters after an overflow event do not thrive well in a cold, salty marine environment and die off within about 48 hours.

Warning signs stay posted at beaches and docks until Public Health- Seattle & King County reviews lab results and approves removal. Washington State Department of Ecology establishes swimming beach water quality standards. WTD posts incident updates to give people choices about recreating in waters where an overflow occurred.
According to Public Health Seattle & King County, bacteria levels at sample sites must be below 100 colony forming units per liter of water three days in a row in order for a beach to be reopened.

Information on beach closures is available on our blog:
https://kingcountywtd.com/2017/03/30/tis-the-season-enjoy-the-natural-beauty-of-our-beaches-and-waterways/.

Can I enter the water if there's a bypass?
Beach closure signs would be posted at public access points and beaches where water quality may be affected by a bypass. When closure signs are posted, it is recommended people and pets stay out of the water.

Signs are taken down when water quality data returns to background levels.
Please visit our incident response page for the latest water quality data:
http://www.kingcounty.gov/depts/dnrp/wtd/response/incident-response.aspx

Are you monitoring water quality?
Yes. In the normal course of our business, we do routine water quality monitoring in Puget Sound and have even increased the frequency and number of locations of water quality monitoring as West Point is restored.

How are you keeping everyone up-to-date on this issue?
We are striving to be as open and transparent as possible with our regulators, the public, the media, and employees. We are reporting facts when we know them and informing agencies or groups that may be affected as soon as possible – including tribes, local agency health and parks departments, beach-goers and others.

Where can I get the most recent information about West Point?

- **Visit www.kingcounty.gov/wtd**
- **Follow us on social media**:
  - Twitter: https://mobile.twitter.com/kingcountyWTD
  - Facebook: https://m.facebook.com/kingcountywtd
  - Instagram: https://www.instagram.com/kingcountywtd/
  - Blog: https://kingcountywtd.com/
- **Contact us via phone or email at**: 206-477-5371 or website.wtd@kingcounty.gov

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